NIDCD National Institute on Deafness and Other Communication Disorders

2012-2016 Strategic Plan

Executive Summary

HEARING AND BALANCE | TASTE AND SMELL | VOICE, SPEECH, AND LANGUAGE

Approximately one in six Americans will experience a communication disorder in his or her lifetime. Communication disorders affect hearing, balance, taste, smell, voice, speech, and language. For hearing and balance: estimates indicate that 36 million American adults report some degree of hearing loss; two to three out of 1,000 babies born in the United States each year have a detectable hearing loss; and almost eight million adults report a chronic problem with balance. For taste and smell: more than 200,000 people visit a physician for taste and smell disorders annually, and many more of these disorders go unreported. For voice, speech, and language: approximately 7.5 million people in the United States have trouble using their voices; by the first grade, roughly five percent of children have noticeable speech disorders, the majority of which have no known cause; and between six and eight million people in the United States have some form of language impairment.

Modern society depends on our ability to communicate with one another. While science and technology have greatly improved this capacity, life can be profoundly difficult for those with communication disorders. Such disorders can affect the emotional, social, educational, and cognitive development of an individual, and the cost of these disorders in terms of human suffering, unfulfilled potential, quality of life, and economic factors is incalculable.

The National Deafness and Other Communication Disorders Act of 1988 became Public Law 100-553 on October 28, 1988, establishing the National Institute on Deafness and Other Communication Disorders (NIDCD) within the National Institutes of Health (NIH). The mission of the NIDCD is to conduct and support biomedical research, behavioral research, and research training in the normal and disordered processes of hearing, balance, taste, smell, voice, speech, and language. The Institute also conducts and supports research and research training related to disease prevention and health promotion; addresses special biomedical and behavioral problems associated with people who have communication impairments or disorders; supports research evaluating approaches to the identification and treatment of communication disorders and patient outcomes; and supports efforts to create devices that substitute for lost and impaired sensory and communication function. NIDCD's focus within this broad mission is to bring national attention to the disorders and dysfunctions of human communication and to advance biomedical and behavioral research to improve the lives of the millions of people with a communication disorder.

To accomplish this mission, NIDCD manages a broad portfolio of both basic and clinical research. The portfolio is organized into three program areas: **Hearing and Balance; Taste and Smell; and Voice, Speech, and Language.** The three program areas seek to answer fundamental scientific questions about normal function and disorders and to identify patient-oriented scientific discoveries for preventing, screening, diagnosing, and treating disorders of human communication.

Public Law 100-553 also requires NIDCD to prepare a plan to initiate, expand, intensify, and coordinate Institute activities concerning the disorders of hearing, balance, taste, smell, voice, speech, and language. NIDCD met this requirement by convening a task force of scientific experts in 1989 to prepare the first strategic plan, which guided the Institute over its first few years. NIDCD has continued to update or rewrite its Plan on a regular basis.

The NIDCD Strategic Plan (Plan) serves four purposes. 1) It helps the Institute to prioritize its research investment. 2) It informs the nation's scientists of emerging areas of opportunity for research and provides them with guidance as they formulate their own research plans. 3) It informs persons with communication disorders and their support organizations of research accomplishments and potential future breakthroughs. 4) Finally, the Plan shares research progress and areas of future research opportunity with the public.

The goals listed in the NIDCD Strategic Plan were selected by experts as research areas that present the greatest scientific opportunities and public health needs over the next five years. The Plan is not a comprehensive list of all research areas that NIDCD is currently supporting or plans to support in the future. Basic and clinical research being supported by NIDCD will continue to be given high priority. The NIDCD is committed to supporting new, innovative, hypothesis-driven, meritorious research, which can lead to improving the health of individuals with communication disorders.

To develop the 2012-2016 Plan, NIDCD convened a series of working groups and solicited input from scientific experts, the National Deafness and Other Communication Disorders Advisory Council, NIDCD staff, and the public. In consultation with communication research scientists and the public, NIDCD identified four Priority Areas that have the potential to increase our understanding of the normal and disordered processes of hearing, balance, taste, smell, voice, speech, and language and to further our knowledge in human communication sciences. They are:

PRIORITY AREA 1

Understanding Normal Function: Deepen our understanding of the mechanisms underlying normal function of the systems of human communication. By defining what is normal in both animal models and humans, we can better understand mechanisms of disease.

PRIORITY AREA 2

Understanding Diseases and Disorders: Increase our knowledge of the mechanisms of diseases, disorders, and dysfunctions that impair human communication and health. Understanding mechanisms that underlie diseases and disorders is an important step in developing better prevention and treatment strategies.

PRIORITY AREA 3

Improving Diagnosis, Treatment, and Prevention: Develop, test, and improve diagnosis, treatment, and prevention of diseases, disorders, and dysfunctions of human communication and health. Diagnosis considers normal function and provides targets for prevention and treatment. Improvements in prevention and treatment lead to better outcomes with fewer side effects.

PRIORITY AREA 4

Improving Outcomes for Human Communication: Accelerate the translation of research discoveries into practice; increase access to health care; and enhance the delivery, quality, and effectiveness of care to improve personal and public health. Scientifically validated prevention and treatment models will lead to better personal and public health only if they are translated effectively into routine practice.

Within each Priority Area, the Plan lists emerging research opportunities identified as goals. A summary of the research goals for each of NIDCD's three program areas are listed below:

HEARING AND BALANCE RESEARCH

Priority Area 1
Understanding Normal Function

- Development of the Auditory and Vestibular System
- Homeostasis and Microenvironment
- Mechanics
- Sensory Cell Transduction
- Cochlear Amplification
- Functional Connectivity
- Perception

Priority Area 2
Understanding Diseases and Disorders

- Epidemiology
- Inherited Disorders
- Otitis Media
- Inflammatory and Autoimmune Responses of the Inner Ear
- Tinnitus
- Other Acquired Disorders
- Pathways and Damage
- Change in Perception with Disease

Priority Area 3
Improving Diagnosis, Treatment, and Prevention

- Regeneration
- Pharmacotherapeutics
- Tinnitus
- Otitis Media
- Interventions for Hearing Loss
- Interventions for Dizziness and Balance Disorders
- Metrics
- Management of Older Adults
- Clinical Trials and Other Clinical Research Studies
- Emerging Technologies (including Bioengineering, Nanotechnology, and Neural Prostheses)
- Training

Priority Area 4
Improving Outcomes for Human Communication

- Hearing Health Care
- Comparative Effectiveness Research and Evidence-Based Medicine
- Implementation and Dissemination Research
- Community-Based Participation in Research

TASTE AND SMELL RESEARCH

Priority Area 1
Understanding Normal Function

- Fundamental Biology of Chemosensory Function
- Peripheral and Central Bases of Flavor
- Chemosensory Receptors Outside of the Nose or Oral Cavity
- Sentinel/Sensory Functions
- Genetic Aspects of Chemosensory Sensitivity
- Central Control of Taste and Smell
- Developing Tools to Measure Taste and Smell Function
- Develop Novel Approaches to Alter Taste Function
- Training

Priority Area 2
Understanding Diseases and Disorders

- Genetic Disorders
- Sinusitis/Rhinitis
- Understanding How the Activity of the Chemical Senses Can Lead to Excessive Consumption
- Epidemiology

Priority Area 3
Improving Diagnosis, Treatment, and Prevention

- Improved Diagnostic Tools and Pharmacological Treatments
- Regenerative Medicine/Tissue Engineering
- Enhancing the Clinical Enterprise

Priority Area 4
Improving Outcomes for Human Communication

- Translational Research

VOICE, SPEECH, AND LANGUAGE RESEARCH

Priority Area 1
Understanding Normal Function

- Laryngeal System
- Motor Speech Production
- Databases
- Developmental Plasticity
- Sign Language Research
- Literacy and Deafness

Priority Area 2
Understanding Diseases and Disorders

- Genetics
- Neural Plasticity
- Epidemiology
- Pathophysiology
- Natural History
- Co-Occurring Conditions

Priority Area 3
Improving Diagnosis, Treatment, and Prevention

- Biomarkers
- Hypothesis-Driven Interventions
- Efficacy
- Prevention
- Improving Literacy in Deaf Individuals
- Understudied Populations
- Assistive Technologies
- Training

Priority Area 4
Improving Outcomes for Human Communication

- Novel Delivery
- Screening
- Comparative Effectiveness Research and Evidence-Based Medicine
- Community-Based Research
- Training
- Bridging the Gap Between Research and Practice

To see the full text of the 2012-2016 NIDCD Strategic Plan, please go to the NIDCD website at http://www.nidcd.nih.gov/about/plans/strategic/.

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